"On Mr. Hodgkinson's experiments on Cast Iron Girders." By Thomas Webster, M.A.; Sec. Inst. C.E.

Iron Girders.

The object of this paper was, to detail the result of an examination of the above experiments, undertaken with the view of ascertaining whether those forms of beams recommended by Mr. Hodgkinson, as requiring greater breaking weight, had also a greater elastic weight than the more ordinary forms, with equal flanches at the top and bottom. The principle assumed by Tredgold (which also was the principle assumed by Dr. Young,) was, that within the elastic limit the forces of extension and compression were equal; whereas Mr. Hodgkinson started with the inquiry as to the law which connected the forces of extension and compression.

Mr. Hodgkinson's experiments must be viewed, as directed entirely to determining the breaking weights, and the earlier weights were not set down in many of the experiments. The weights and deflections first recorded, were in many cases, very near the elastic weight and the point of permanent set, so that there was great difficulty in applying the principle already laid down,* for determining the elastic weight. But in some of the experiments which had a long series of early weights, it would be seen, on comparing the increase of deflection, with the increase of weight, that this ratio changed from one of equality, sooner in these forms, than in those with equal flanches at the top and bottom. If then, the beams with large bottom flanches did possess practical advantages, it might be, from their allowing a violation of the elastic limit, with comparative safety; this was however, a state of things which ought never to be contemplated.

April 4, 1837.

BRYAN DONKIN, V.P., in the Chair.

"Results of experiments, made with a view to determine the best figure and position for Wooden Bearers, so as to combine lightness and strength." By James Horne, F.R.S.; Assoc. Inst. C.E.

Wooden Bearers.

The results of several experiments on wooden bearers of different sections were tabulated in this paper; together with the dimensions and weights of the pieces, and the nature of the fracture. The conclusion at which Mr. Horne arrived was, that a triangular prism, placed with its

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* Vide ante, page 27.